

REMARKS

Reconsideration of this application is respectfully requested in view of the foregoing amendment and following remarks.

Applicant appreciates the indication of allowable subject matter in claims 4, 5, 9 and 10 of the present application.

By the foregoing amendment, claims 11 and 15 have been amended. No new matter is added. Claims 13-14 and 17-18 were previously canceled. Thus, claims 1-12, 15 and 16 are currently pending in the application and subject to examination.

Rejections Under 35 U.S.C. § 112

In the Office Action mailed March 9, 2006, the Examiner rejected claims 1, 6 and 15 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. The Applicant hereby traverses the rejection as follows.

In making this rejection, the Office Action asserts that the limitation “non-readout rows of unequal interval” of claims 1 and 6 appears only in the “Description of the Related Art” and is illustrated only in Fig. 8, which shows prior art. The Office Action asserts that this subject matter, since it is allegedly described only with respect to the prior art, “was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.” Office Action, p. 4.

With regard to claim 15, the Office Action asserts that the limitation the “second unit being at a position apart from said first unit by four photoelectric converter element rows in the column direction” “does not appear anywhere in the specification in the context of what could be considered claim 15. Furthermore, the only Figure that shows

a separation by four rows is Figure 8 which is a prior art figure.” The Office Action therefore concludes that this subject matter, since it is allegedly described only with respect to the prior art, “does not convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.” Office Action, pp. 4-5.

The Applicant traverses this rejection of claims 1, 6 and 15 at least because, as admitted by the Office Action, the subject matter is described in the specification as filed. Hence, the inventor clearly had possession of the claimed subject matter at the time the application was filed.

Moreover, with respect to claims 1 and 6, at least the following descriptions apply. Page 17, line 14 to page 18, line 23 describes reading of rows L1 and L6, and rows L2 and L5 after transfer. Fig. 1 shows the successive reading of charges. Rows L6 and L1 are four rows above the rows L2 and L5. The concept of reading and transferring rows of charges in the claimed invention is summarized at p. 20, lines 11-12, which state, “Although each readout operation is asymmetric, the readout pattern as a whole becomes symmetric.” Page 25, lines 21-23 describes a similar concept. Page 11, line 12 to page 12, line 4 describes the transfer of first read charges by four rows. Fig. 1 shows transfer of four rows. Thus, the Applicant submits that the technical concept of “non-readout rows of unequal interval” is supported by the description at least in these passages.

In addition, with respect to claim 15, at least Fig. 1 of the subject application clearly shows the first unit being spaced apart from the second unit by four photoelectric converter element rows.

Rejections Under 35 U.S.C. § 102

In the outstanding Office Action, the Examiner rejected claims 11 and 15 under 35 USC § 102(b) as being anticipated by Udagawa (U.S. Patent No. 5,880,781, hereinafter “Udagawa”). It is noted that claims 11 and 15 have been amended. To the extent that the rejections remain applicable to the claims currently pending, the Applicant hereby traverses the rejections, as follows.

In making this rejection, the Examiner asserts that Udagawa discloses an array of color filters including a plurality of units, each unit consisting of two adjacent photoelectric converter element rows, said units being repeatedly and contiguously arranged in said array in a column direction, in which one color filter of the array is formed over each of said photoelectric converter elements, wherein, the first row of each unit has a first color layout of color filters arranged in a row direction and the second row of each unit has a second color layout of color filters arranged in the row direction, said second color layout being different from said first color layout, by the rows starting C1 and M1 (as one unit) and the rows starting C3 and G3 (as a second unit) in Figs. 1 and 2a thereof.

However, in claim 11, each unit consists of two adjacent photoelectric converter element rows. The units are repeatedly and contiguously arranged in the column direction. The first row of each unit has a first color layout of color filters. The second row of each unit has a second color layout of color filters. The first color layout of color filters is different from the second color layout of color filters.

In Udagawa, the first “unit” (as interpreted by the Examiner) rows starting C1 and M1 consists of two rows, and the second “unit” (as interpreted by the Examiner) rows

starting C3 and G3 also consists of two rows. In addition, the first row of the first and second “units” (as defined by the Examiner) have a first color layout of color filters (i.e., C Y C). However, the second row of the first and second “units” (as defined by the Examiner) have a second color layout of color filters (i.e., M G M), and a third color layout of color filters (i.e., G M G), respectively. Moreover, the first row of the “unit” (following the Examiner’s interpretation, the rows starting Y2 and G2) positioned between the first and second “units” (as defined by the Examiner), has a fourth color layout (i.e., Y C Y), and the second row thereof has the third color layout (i.e., G M G).

Thus, Udagawa does not disclose or suggest at least the combination of an array of color filters including a plurality of units, each unit consisting of two adjacent photoelectric converter element rows, said units being repeatedly and contiguously arranged in said array in a column direction, in which one color filter of the array is formed over each of said photoelectric converter elements, wherein, the first row of each unit has a first color layout of color filters arranged in a row direction and the second row of each unit has a second color layout of color filters arranged in the row direction, said second color layout being different from said first color layout, and the combination of a drive circuit capable of applying readout pulse voltages to said vertical charge transfer electrodes corresponding to said photoelectric converter element row having said first color layout in a first unit and to said vertical charge transfer electrodes corresponding to said photoelectric converter element row having said second color layout in a second unit, said second unit being at a position apart from said first unit by two units in the column direction, as recited in claim 11, as amended.

For at least these reasons, the Applicant submits that claim 11, as amended, is allowable over the cited prior art. As claim 11 is allowable, the Applicant submits that claim 12, which depends from allowable claim 11, is likewise allowable over the cited prior art.

The Applicant further submits that Udagawa fails to disclose or suggest the present invention as claimed in claim 15, as amended. Amended claim 15 recites a method of controlling a solid-state image pickup device. In amended claim 15, the solid state image pickup device has an array of color filters including a plurality of units, each unit consisting of two adjacent photoelectric converter element rows, the units being repeatedly and contiguously arranged in the array in a column direction, in which one color filter of the array is formed over each of the photoelectric converter elements, wherein, the first row of each unit has a first color layout of color filters arranged in a row direction and the second row of each unit has a second color layout of color filters arranged in the row direction, the second color layout being different from the first color layout.

Further, the solid state image pickup device of amended claim 15 also includes a plurality of vertical charge transfer electrodes in which two vertical charge transfer electrodes are disposed over vertical charge transfer channel regions for each of the rows of the photoelectric converter elements. The method of amended claim 15 includes a) classifying the vertical charge transfer electrodes into sets each of which includes 16 vertical charge transfer electrodes as one set, the 16 vertical charge transfer electrodes ranging from a first vertical charge transfer electrode to a 16th vertical charge transfer electrode succeeding one after another. Readout pulse

voltages are applied to the vertical charge transfer electrodes belonging to the photoelectric converter element row having the first color layout of the first unit, the first unit being selected from each of the sets, and to the vertical charge transfer electrodes belonging to the photoelectric converter element row having the second color layout different from the first color layout of the second unit. The photoelectric converter element rows of the second unit are formed in positions spaced apart from positions of respective photoelectric converter element rows of the first unit by four photoelectric converter element rows in the column direction. The method further includes b) transferring the signal charge read out by step a) through the vertical charge transfer channel regions for four photoelectric converter element rows in the column direction; c) applying readout pulse voltages to the vertical charge transfer electrodes belonging to the photoelectric converter element rows of the first and second units, which are not used to read the electric charge therefrom in the step a); and d) transferring the electric charge read out in the step c) and the electric charge read out in the step a) in the vertical charge transfer channel regions.

Thus, in amended claim 15, charges are read from the photoelectric converter element row having the first color layout of the first unit (in each set), and from the photoelectric converter element row having the second color layout different from the first color layout of the second unit (in each set) (step a). The photoelectric converter element rows of the second unit are formed in positions spaced apart from positions of the respective photoelectric converter element rows of the first unit by four photoelectric converter element rows in the column direction. Then, the charges read out in step a are transferred by four rows in the column direction (step b), and charges are read from

the photoelectric converter element rows of the first and second units from which charges were not read in the step a (step c). Thus, when the charges are read out from the photoelectric converter element rows of the second unit in step c, they are added to the transferred charges that were read out from the photoelectric converter element rows of the first unit in the step a. In addition, by the claimed arrangement of color filters formed on the rows of the units, the claimed placement of the first and second units, and the claimed method of reading and transferring charges from rows of the units, same color charges are added in the method of amended claim 15. In addition to teaching an array having a different structure than that of amended claim 15, and teaching an image pick-up method different from the method of amended claim 15, Udagawa further teaches adding charges of different colors.

Thus, the Applicant submits that Udagawa does not disclose or suggest at least the combination of a) classifying said vertical charge transfer electrodes into sets each of which includes 16 vertical charge transfer electrodes as one set, said 16 vertical charge transfer electrodes ranging from a first vertical charge transfer electrode to a 16th vertical charge transfer electrode succeeding one after another, and applying readout pulse voltages to said vertical charge transfer electrodes belonging to said photoelectric converter element row having said first color layout of said first unit, said first unit being selected from each said set and to said vertical charge transfer electrodes belonging to said photoelectric converter element row having said second color layout different from said first color layout of said second unit, the photoelectric converter element rows of said second unit being formed in positions spaced apart from positions of the respective photoelectric converter element rows of said first unit by four

photoelectric converter element rows in the column direction; b) transferring the signal charge read out by said step a) through said vertical charge transfer channel regions for four photoelectric converter element rows in the column direction; c) applying readout pulse voltages to said vertical charge transfer electrodes belonging to said photoelectric converter element rows of said first and second units, which are not used to read the electric charge therefrom in said step a); and d) transferring the electric charge read out in said step c) and the electric charge read out in said step a) in said vertical charge transfer channel regions, as recited in claim 15, as amended.

For at least these reasons, the Applicant submits that claim 15, as amended, is allowable over the cited prior art. As claim 15 is allowable, the Applicant submits that claim 16, which depends from allowable claim 15, is likewise allowable over the cited prior art.

Rejections Under 35 USC § 103(a)

The Examiner rejected claims 1-3 and 6-8 under 35 USC § 103(a) as being unpatentable over Kobayashi et al. (U.S. Patent No.: 6,750,911, hereinafter "Kobayashi") in view of Uya (U.S. Patent Publication No. 2002/0135689), and claims 12 and 16 under 35 USC § 103(a) as being unpatentable over Udagawa in view of Tanaka (U.S. Patent No.: 6,559,889, hereinafter "Tanaka"). The Applicant traverses these rejections, as follows.

We note that Uya (U.S. Patent Publication No. 2002/0135689) is not a proper prior art reference to this application because it is the publication of this application. Thus, the rejection is improper and should be withdrawn for at least this reason. Based on a brief discussion with the Examiner on May 31, 2006, to the extent that the rejection

was only referring to the Applicant's Admitted Prior Art (AAPA), the Applicant submits that the rejection is improper, as follows.

In order for the Examiner to establish a prima facie case for obviousness, three (3) criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to those of ordinary skill in the art, to modify the primary reference as the Examiner proposes. Second, there must be a reasonable expectation of success in connection with the Examiner's proposed combination of the references. And third, the prior art references must disclose or suggest all of the claim limitations. MPEP § 2143. The Applicant submits that the Examiner fails to satisfy his burden of establishing a prima facie case for obviousness at least because the Examiner fails to show sufficient motivation for combining Kobayashi and the AAPA as suggested, and moreover, the Examiner fails to show, in the event one did combine the references (not admitted), that the combination discloses or suggests each and every feature recited in claims 1-3 and 6-8.

In making the rejection, the Examiner asserts that Kobayashi discloses a first readout operation for reading electric charges from a first group of photoelectric converter element rows, transferring the first read out charges jxn rows, and a second readout operation for reading second electric charges from a second group of photoelectric converter element rows. The Examiner defines the first group of photoelectric converter element rows as the rows beginning R4 and G4 in Fig. 6 of Kobayashi, and the second group of photoelectric converter element rows as the rows beginning R3 and G3 in Fig. 6. *Office Action*, p. 11, lines 15-16 and page 12, lines 3-4. The Examiner defines the jxn rows transfer operation as a four row transfer, with $j = 2$

and $n = 2$. *Office Action* page 11, lines 20-22. Claim 1 recites that the rows of the second readout operation (the second group of rows) are at positions $j \times n$ rows downstream of the rows of said first read-out operation. As shown in Fig. 6 of Kobayashi, the rows beginning R3 and G3 are not $j \times n$ (or four, as defined by the Examiner) rows downstream of the rows beginning R4 and G4. Thus, in Kobayashi, the second readout operation is not performed on rows $j \times n$ rows downstream of the rows of the first readout operation, as recited in claim 1. The AAPA does not cure this deficiency of Kobayashi.

Moreover, Kobayashi is directed to a digital camera having a CCD imager in which three electrodes M are provided per row of pixels and all of the charges are read in two reading operations. In contrast, the AAPA discloses an image sensor having two electrodes per row, and reading only one-fourth of the pixels. Thus, the Applicant submits that there is no motivation to combine the references as suggested, at least because doing so would prevent the imager of Kobayashi from functioning as intended.

For at least these reasons, the Applicant submits that the rejection of claims 1-3 and 6-8 as being unpatentable over Kobayashi in view of the AAPA is improper, and withdrawal of the rejection is requested.

Regarding claims 12 and 16, the Applicant submits that Tanaka fails to cure the deficiencies of Udagawa set forth above with respect to amended claims 11 and 15. Thus, amended claims 11 and 15 are allowable over the combination of Udagawa and Tanaka. As claims 11 and 15 are allowable, the Applicant submits that claims 12 and 16, which depend from allowable claims 11 and 15, respectively, are likewise allowable over the combination of Udagawa and Tanaka.

CONCLUSION

For all of the above reasons, it is respectfully submitted that the claims now pending patentability distinguish the present invention from the cited references. Accordingly, reconsideration and withdrawal of the outstanding rejections and an issuance of a Notice of Allowance are earnestly solicited.

Should the Examiner determine that any further action is necessary to place this application into better form, the Examiner is encouraged to telephone the undersigned representative at the number listed below.

In the event this paper is not considered to be timely filed, the Applicant hereby petitions for an appropriate extension of time. The Commissioner is hereby authorized to charge any fee deficiency or credit any overpayment associated with this communication to Deposit Account No. 01-2300, referencing docket number **107317-00044**.

Respectfully submitted,



Wilburn L. Chesser
Registration No. 41,668

Customer No. 004372
ARENT FOX PLLC
1050 Connecticut Ave., N.W., Suite 400
Washington, D.C. 20036-5339
Telephone No. (202) 857-6104
Facsimile No. (202) 857-6395

WC/MLC:elz